GENERAL RESPONSE ACTIONS FOR SEDIMENT [a]
With Initial Screening of Technologies and Process Options

General Response Action	Remedial Technology	Process Option	Description of Process Option	Applicability/ Reason for Elimination
No Action	None	None	No action would be taken and the operation of the existing water treatment plant (WTP) would cease. The contaminated area remains in its existing condition.	Required for consideration by NCP.
No Further Action	None	None	No new action would be taken, however the existing WTP would continue to operate without significant upgrades or repairs.	Retained for further consideration.
Institutional Controls	Land Use Controls	Deed/Zoning Restrictions	Restrictions would be used to prevent use or transfer of property without notification of limitations on the use of the property.	Retained for further consideration.
	Access Restrictions	Physical Restrictions (Fencing and Posted Warnings)	Warning signs would be used and fences installed to restrict access. Monitoring would be performed to ensure controls remain in place.	Retained for further consideration.
	Community Awareness	Information and Educational Program	Community information and education programs would be undertaken to enhance awareness of potential hazards and remedies.	Retained for further consideration.
Monitoring	None	Long-term monitoring of COCs	Ongoing monitoring of COCs in sediment.	Retained for further consideration.
Containment	Barriers/Source Controls	Soil Cover	Contaminated sediments would be covered with clean soil.	Technically feasible and potentially applicable.
		Rock Armoring	Contaminated sediments would be covered with inert natural rock materials and/or riprap to reduce exposure and erosion.	Technically feasible and potentially applicable.
		Sedimentation Dams/Traps	Sedimentation dams and traps would be constructed to capture and contain contaminated sediment in runoff to control downstream transport.	Technically feasible and potentially applicable.
		Channelization	Lining of channel to isolate contaminated sediments.	Technically feasible and potentially applicable.

GENERAL RESPONSE ACTIONS
FOR SEDIMENT [a]
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General Response Action	Remedial Technology	Process Option	Description of Process Option	Applicability/ Reason for Elimination
Containment (continued)	Barriers/Source Controls (continued)	Biostabilization	Reduce exposure and erosion using vegetation and other natural materials.	Technically feasible and potentially applicable.
		Burial	Contaminated sediments in the pits would be buried beneath mining waste materials to eliminate direct exposure as part of an engineered containment system.	Technically feasible and potentially applicable.
		Flooding Open Pits	Open pits would be filled with clean water and high water level maintained to reduce volume of contaminated groundwater entering pits, reduce exposure to contaminated sediment, and maintain dust control.	Not Retained. Lack of available clean water source.
Excavation, Transport, Disposal	Removal [b]	Mechanical Excavation/Dredging	Sediments would be removed from the contaminated areas using mechanical excavation methods.	Technically feasible and potentially applicable.
		Suction Dredging	Contaminated sediments would be dredged using suction dredging methods.	Technically feasible and potentially applicable.
	Transport	Slurrying	Removed contaminated sediments would be slurried in a pipe for disposal.	Technically feasible, however it may cause environmental damage.
		Truck Hauling	Removed contaminated sediments would be hauled by truck to disposal site.	Technically feasible and potentially applicable.
	Off-Site Disposal	See GRAs for Surface and Stockpiled Material (Table 2-1)		
	On-Site Disposal	See GRAs for Surface and Stockpiled Material (Table 2-1)		
Treatment	Physical/Chemical	Soil Washing	COCs sorbed onto fine particles are separated from bulk soil in an aqueous based system on the basis of particle size. The wash water may be augmented with a reagent to help remove COCs.	Technically feasible and potentially applicable. Would require treatability testing.

GENERAL RESPONSE ACTIONS FOR SEDIMENT [a]
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General Response Action	Remedial Technology	Process Option	Description of Process Option	Applicability/ Reason for Elimination
Treatment (continued)	Physical/Chemical (continued)	In-situ Stabilization	Contaminated sediments would be treated with a reactive chemical to stabilize or reduce bioavailability of COCs. The chemical would render the COCs insoluble or bind them chemically to the sediment.	Technically feasible and potentially applicable. Would require treatability testing.
		Ex-situ Stabilization	Contaminated sediments would be excavated and chemically stabilized (mixed with cement, lime, fly ash, stabilizing additives) on site.	Technically feasible and potentially applicable. Would require treatability testing.
		Neutralization	Contaminated sediments would be chemically neutralized to reduce acid mine drainage (addition of lime, phosphate or other neutralizing agents) on site.	Technically feasible and potentially applicable. Would require treatability testing.
		Solvent Extraction	A solvent would be applied to and extracted from the contaminated sediment. Contaminants would be transferred from excavated material to the solvent and then extracted from the solvent.	Not Retained. Not feasible for application to this site. Technology requires further development for radionuclides and mixed waste.
	Biological	Aerobic Treatment	Microorganisms are used to degrade contaminants in an oxygen rich environment.	Not Retained. Not effective for metals and radionuclides.
		Ex-Situ Anaerobic	Biological reactions are utilized for chemical reduction of the contaminants to low solubility forms in an oxygen free environment.	Technically feasible and potentially applicable. Would require treatability testing.
		In-Situ Bioremediation	Naturally occurring or inoculated microbes are used to enhance degradation of COCs.	Not Retained. Not effective for metals and radionuclides.
		Phytoremediation	Direct use of plants and their associated rhizospheric microorganisms to remove, degrade or contain chemical contaminants.	Technically feasible and potentially applicable.

GENERAL RESPONSE ACTIONS FOR SEDIMENT [a]
With Initial Screening of Technologies and Process Options

Denotes remedial technology process option that will not be carried forward for additional evaluation.

[a] Sediment includes those present open pits, ponds, and affected drainages.
[b] Process options for water treatment are presented in Table 2-4 should it be necessary to remove water to access sediment.

Notes: 1) Multiple response actions and remedial technologies will be combined to develop alternatives for sediment.

2) Process options retained for additional evaluation may not be applicable to all locations of the site or material types present at the site.

3) Based on the NCP, consolidation/containment remedial technologies are preferred for contaminated material with large volumes and low concentration levels. Smaller volumes of material with higher concentrations are more suited for treatment.

4) Remedial technologies requiring treatability testing could be performed during the remedial design phase.